Odor Rule Workgroup

Meeting One

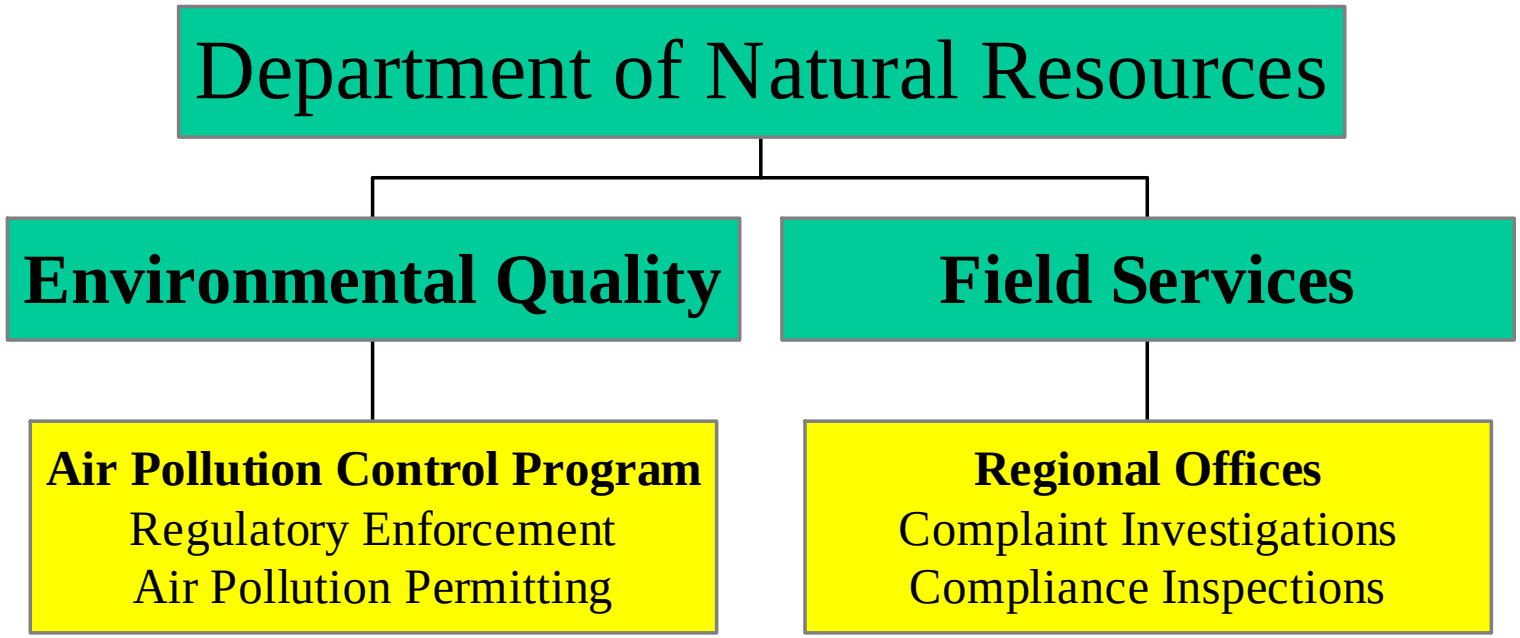
January 30, 2007

Missouri
Department of
Natural Resources

Why are we here?

- Formal petition under Chapter 536, RSMo
- Last major rule review in 1998
- Vast body of science has accrued
- Odor complaints are consistently the largest subset of air quality related complaints to the department
- Numerous citizens have expressed concerns about how odor is regulated

MDNR Regulatory Functions Related to Odor



Odor Parameters

- Threshold: measured by the amount of dilution required to bring the odor to its threshold (detection/recognition)
- Intensity: strength of odor about recognition threshold compared to a known concentration of a reference odorant
- Persistency: the rate at which the perceived intensity decreased as odor is diluted
- Hedonic Tone: the pleasantness or unpleasantness of an odor
- Characterization: odor quality, reported using standard descriptors

Underlined parameters are used in current rule

Reference: St. Croix Sensory

Olfactometer

Definition from the American Heritage College Dictionary (3rd Edition): An apparatus for measuring the acuity of the sense of smell

Types of Field Olfactometers Currently Used by MDNR

- Scentometer® manufactured by Barnaby Cheney Company
- Nasal Ranger® manufactured by St. Croix Sensory, Inc.

Laboratory Olfactometry

- Sample collected using vacuum chamber and Tedlar® bag
- Sample shipped to lab for evaluation by odor panel
- Odor panelists must meet strict criteria
- Criteria and procedure set forth in ASTM standard **ASTM E679-04** Determination of Odor and Taste Threshold by a Forced-Choice Ascending Concentration Series Method of Limits. (United States)

Photo from website of Purdue Agricultural Air Quality Lab
http://pasture.ecn.purdue.edu/~odor/facilities.htm

History of Odor Regulations

- The odor rules are some of the oldest on the books, all four original rules predate DNR (agency created in 1974)
- Last major revision was in 1999, when Class IA CAFO's were brought into rule
- Ongoing odor rulemaking making minor revisions is proceeding in parallel to this workgroup

Summary of Missouri's Odor Regulations (Except St. Louis Metro)

- Odor detected at 7:1 D/T twice, at least fifteen minutes apart, but both detections within an hour;
- Exemption for " . . . Raising and harvesting of crops . . . Feeding, breeding and management of livestock or domestic animals or fowl . . ."
- Class IA CAFO's must have odor control plan. Two odor standards apply to Class IA CAFO's:
  - Best Estimate Detection Threshold of 110 or greater
  - Intensity of greater than 225 ppm compared to n-butanol

Summary of St. Louis Metro Rule

- For residential, recreational, institutional, retail sales, hotel or educational premises a violation occurs if odor is deemed objectionable by:
  - 30% of people exposed (if sample size is at least 20 people)
  - 75% of people exposed if sample size is fewer than 20 people
- For industrial premises when D/T is 20:1 and survey results deem the odor objectionable as described above
- For all other premises when D/T is 4:1 and survey results deem the odor objectionable as described above
- Class IA CAFO provisions and agricultural exemption same as the other three rules

Unique Approaches in Other States

- North Dakota: 7:1 D/T beyond property line in urban areas; 7:1 D/T within 100 feet of receptor in rural areas;
- Massachusetts: uses dispersion modeling, with established odor emission limits as part of their new source permitting process (not to exceed 5 D/T at property line). Similar approach in Ontario, Canada;
- Texas: formal "Nuisance Protocol" with 5 categories of odor and prioritization based on health affects to neighbors;

Source: A Review of National and International Odor Policy, Odor Measurement Technology and Public Administration, available online at: http://www.pca.state.mn.us/publications/p-gen2-02.pdf

Summary of Approaches to Odor Regulation

- Regulation of individual compounds as odor surrogates
- Limits or standards on odor strength
- Requirement for Best Available Control Technologies
- Requirement of separation distances
- Enhanced nuisance-based approach
- Community odor work

Source: A Review of National and International Odor Policy, Odor Measurement Technology and Public Administration, pp. 72-73, available online at: http://www.pca.state.mn.us/publications/p-gen2-02.pdf

Questions?